

Bellingham Bay Demonstration Pilot

Mike Stoner

Port of Bellingham

Lucy Pebles and Rachel Friedman-Thomas

Washington State Department of Ecology

Tom Schadt

Anchor Environmental, L.L.C.

Introduction

This paper presents an update on the status of the Bellingham Bay Demonstration Pilot (Pilot). The first section provides background information on the Pilot and its objectives. The next section presents the approach being used including what will be accomplished, the regulatory framework for documenting the work, and the process that has been followed. The third section presents the current status of the project and summarizes the major findings made to date. The final section describes the next steps in the Pilot.

Background and Objectives

In 1996, a group of six state and federal agencies formed the Cooperative Sediment Management Program (CSMP) to address the need for sediment cleanup and overcome some of the existing roadblocks to expedited action. The CSMP agencies include:

- Washington Department of Ecology;
- U.S. Army Corps of Engineers;
- Washington State Department of Transportation;
- U.S. Environmental Protection Agency;
- Washington State Department of Natural Resources;
- Puget Sound Water Quality Action Team.

These agencies developed a demonstration pilot concept that was designed to have federal and state agencies working cooperatively with local government and businesses to collectively address sediment problems in Puget Sound's urban bays. The Pilot is funded by the Department of Ecology's Local Toxics Control Account established through the Model Toxics Control Act (MTCA).

In June 1996, following discussions with interested parties from four urban bays in Puget Sound, Bellingham Bay was selected as the location for the CSMP's demonstration pilot. Bellingham Bay was selected in part due to the responsiveness of a local group describing collaborative efforts already underway. This group included the Port of Bellingham, City of Bellingham, Whatcom County Health Department, and Georgia-Pacific West, Inc. The local group emphasized the need to focus on practical, cost-effective approaches to sediment management that could provide both environmental and economic improvements to the local community. The Pilot was seen as an opportunity to evaluate the potential for achieving multiple objectives in Bellingham Bay through comprehensive strategic environmental planning and well-integrated projects that would encompass contaminated sediment cleanup, sediment disposal, habitat restoration, source control, and shoreline property management. The Pilot was initiated in the fall of 1996 with the establishment of the Bellingham Bay Work Group (BBWG). The BBWG includes representatives from:

- Washington Department of Ecology;
- Washington State Department of Natural Resources;

Puget Sound Research '98

- Washington State Department of Transportation;
- U.S. Army Corps of Engineers;
- Port of Bellingham;
- City of Bellingham;
- Whatcom County Health Department;
- Georgia-Pacific West, Inc.;
- Washington Department of Fish and Wildlife;
- U.S. Fish and Wildlife Service;
- U.S. Environmental Protection Agency;
- Puget Sound Water Quality Action Team;
- Huxley Environmental College;
- Nooksack Tribe;
- Lummi Nation.

The BBWG first established a consensus-based decision making framework, identified the geographic scope of the project as being all of Bellingham Bay from Governor's Point to Portage Island (Figure 1), and confirmed a focus on toxic substances rather than conventional pollutants. A mission statement, objectives, and a draft scope of work to meet those objectives were then developed. In April of 1997, a consultant team was selected to implement the scope with BBWG oversight.

Pilot Mission and Objectives

Consistent with the intent of the CSMP, the BBWG developed the following mission statement for the Pilot: "Use a new cooperative approach to expedite source control, sediment cleanup and associated habitat restoration in Bellingham Bay."

To achieve this mission the BBWG developed broad objectives falling into three categories as listed below:

Environmental Objectives

- Implement a thoughtful planning approach for integrated environmental actions within Bellingham Bay, including source control, sediment cleanup and protection of aquatic resources;
- Prioritize and take early action on contaminated sediment sites that pose a threat to public health and the environment in the bay. Specific examples include:
 - Whatcom Waterway MTCA Site;
 - Cornwall Avenue Landfill MTCA Site;
 - Harris Avenue Shipyard MTCA Site.
- Design and permit a multi-user disposal site for contaminated sediments associated with priority problem areas.

Process Objectives

- Build a comprehensive record of existing environmental and land use information to support planning efforts in Bellingham Bay.
- Develop and utilize a coordinated regulatory process to provide more streamlined and predictable permitting, design and implementation of priority projects.
- Consider a reasonable range of alternatives for sediment remediation that are protective, cost-effective and practicable within an urban embayment.

- Maintain coordination with other sources of emerging information regarding sediment remediation and habitat mitigation.
- Provide for effective integration of environmental remediation with economic development, including cleanup and redevelopment of contaminated property, coordination of project timelines to achieve multiple objectives, and maintaining flexibility for individual landowners.

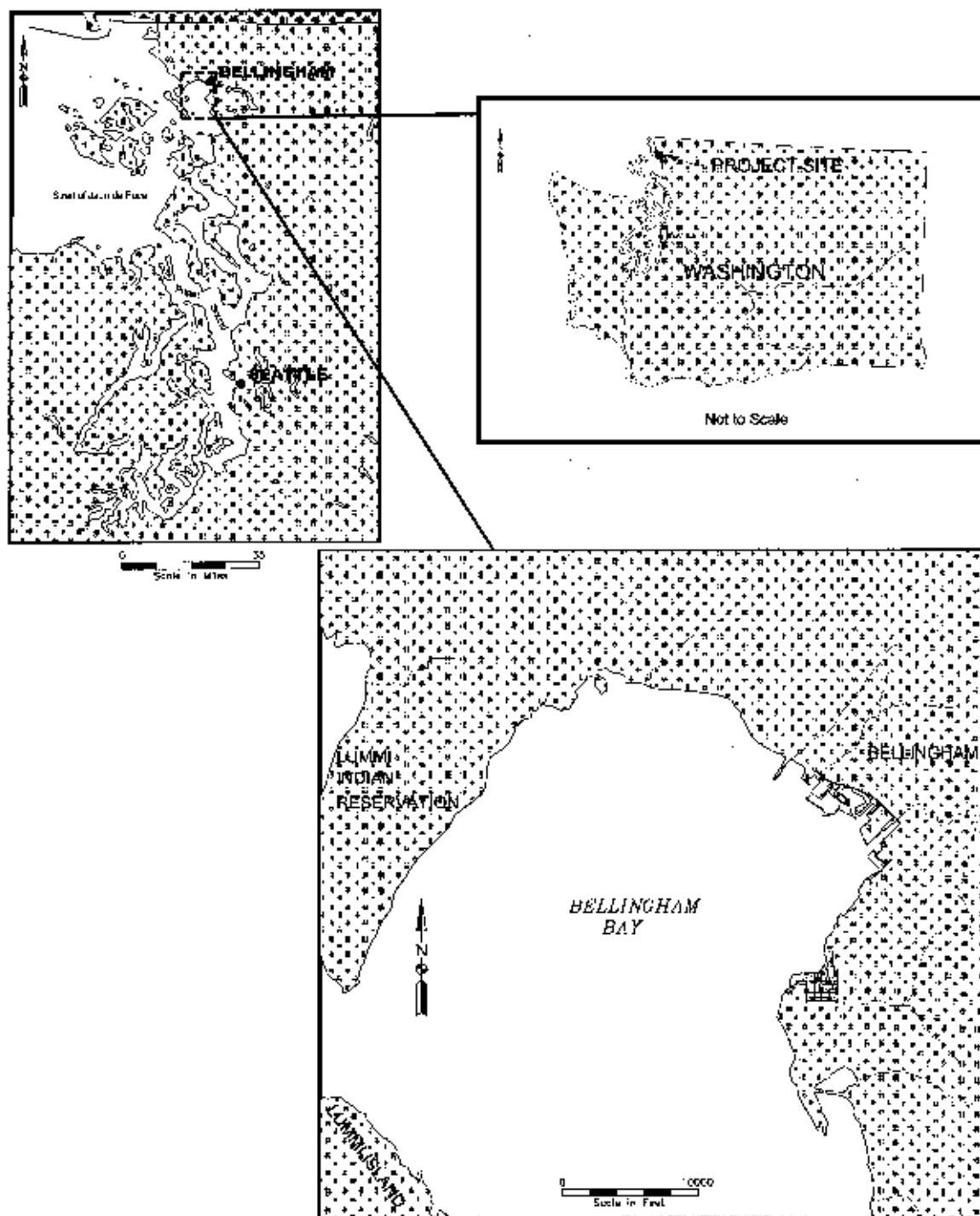


Figure 1. Vicinity map, project area.

Partnering Objectives

- Develop a framework for sediment remediation that is among cooperative partners, environmentally protective, cost-effective and practicable within the urbanized portion of Bellingham Bay.
- Maintain an effective working relationship among project participants by:
 - ensuring federal, state, tribal and local participation;
 - providing a forum for cooperative, consensus-based decision-making;
 - utilizing local expertise and resources as much as possible;
 - identifying and implementing means of broad public participation;
 - allowing for future expansion of the current work group as appropriate.
- Identify and coordinate public and private opportunities for project participation and funding, including a framework for project cost sharing.
- Provide for cooperative resolution of liability for historical environmental problems associated with contaminated marine sediments with less litigation, less administrative redundancy, and less project delay.
- Document elements of the Pilot that may be transferable to other locations.

Overall Approach—Methods

The objectives of the Pilot represent a unique and comprehensive approach for achieving environmental results that are as efficient, effective, and as well-balanced as possible. To meet these broad objectives five project elements were identified, as well as the need for both short-term actions and planning for long-term actions. The five project elements are sediment cleanup, sediment disposal siting, source control, habitat restoration, and aquatic land use. To set priorities within each of these elements, brief goal statements reflecting the collective interests of the BBWG were developed. Once priorities were identified they were integrated into project alternatives to be implemented in the short-term. Priorities not included in the project alternatives will be carried forward in planning documents for future implementation. Determining the appropriate regulatory framework to document this work, and developing an effective prioritization process were key issues for the Pilot.

Regulatory Framework

A State Environmental Policy Act (SEPA) environmental impact statement (EIS) will be the primary work product of the Pilot. The EIS will document the Pilot process, evaluate the project alternatives for short-term actions that have been crafted from integrating priorities within each project element, and will contain planning documents to guide long-term actions. The EIS will also satisfy the project-specific SEPA requirements for individual sediment-cleanup sites addressed in the project alternatives.

Beyond the project-oriented alternatives, the EIS will also include planning documents as appendices. These will include the Remedial Action Plan, Habitat Restoration Plan, and Aquatic Land Use Plan. These “plans” will document the BBWG’s vision of the future, but will not be binding. If any of the actions identified in the plans are implemented in the future, they will undergo their own environmental review. However, the Bellingham Bay Demonstration Pilot EIS could be used as the basis for their analysis. The EIS is expected to streamline the regulatory process, the coordination of public involvement, and the negotiation of cost sharing among parties for both short and long term actions.

Pilot Process

The Pilot needed a process to identify priorities within each of the project elements since the integration of these determines the short-term actions that will be taken. The elements that have been defined in the Pilot are sediment cleanup, sediment disposal, source control, habitat restoration, and

aquatic land use. In each case, priority project actions will be included within the short-term alternatives in the EIS, and long-term project elements will be addressed in attached planning documents. For example, priority sediment sites will be targeted for expedited cleanup and included in the project alternatives, and other sites will be carried into the Remedial Action Plan to be addressed in the future.

Pilot success depends on integrating multiple priorities into project alternatives that can be implemented in the short term. An ongoing challenge has been to ensure that the various interests represented by the BBWG members are both understood and reflected in a well balanced process. The framework that has been developed to guide the Pilot is depicted in Figure 2. The process was not well developed at the onset of the project, but through adaptive management, an approach that identifies and integrates priorities was developed. The chart depicts the method used by the Pilot to develop priorities within each element and integrate them into project alternatives for evaluation in the EIS.

Existing data were compiled and evaluated for each project element and brought forward into element specific subcommittees comprised of BBWG members with expertise and interest. To prioritize the lists of information generated from this exercise, the BBWG defined a set of comprehensive goals, which were then transformed into evaluation criteria and scoring guidelines by the subcommittees. This work has been completed and the BBWG is currently going through the final step, integrating priorities into project alternatives, before initiating the EIS.

Pilot Status

Goals, Evaluation Criteria and Scoring Guidelines

Development of goals was an exercise in multiple stakeholder decision making, with each BBWG member contributing to defining the goals. Through this exercise, seven broad goals were defined and categorized as primary or secondary goals:

Primary Goals

1. Human Health and Safety—implement actions that will enhance the protection of human health.
2. Ecological Health—implement actions that will protect and improve the ecological health of the bay.
3. Protect and Restore Ecosystems—implement actions that will protect, restore, or enhance habitat components making up the bay's ecosystem.

Secondary Goals

4. Social and Cultural Uses—implement actions that are consistent with or enhance cultural and social uses in the bay and surrounding vicinity.
5. Resource Management—maximize material re-use in implementing sediment cleanup actions, minimize the use of renewable resources, and take advantage of existing infrastructure where possible instead of creating new infrastructure.
6. Faster, Better, Cheaper—implement actions that are more expedient and more cost effective, through approaches that achieve multiple objectives.
7. Economic Vitality—implement actions that enhance water dependent uses of commercial shoreline property.

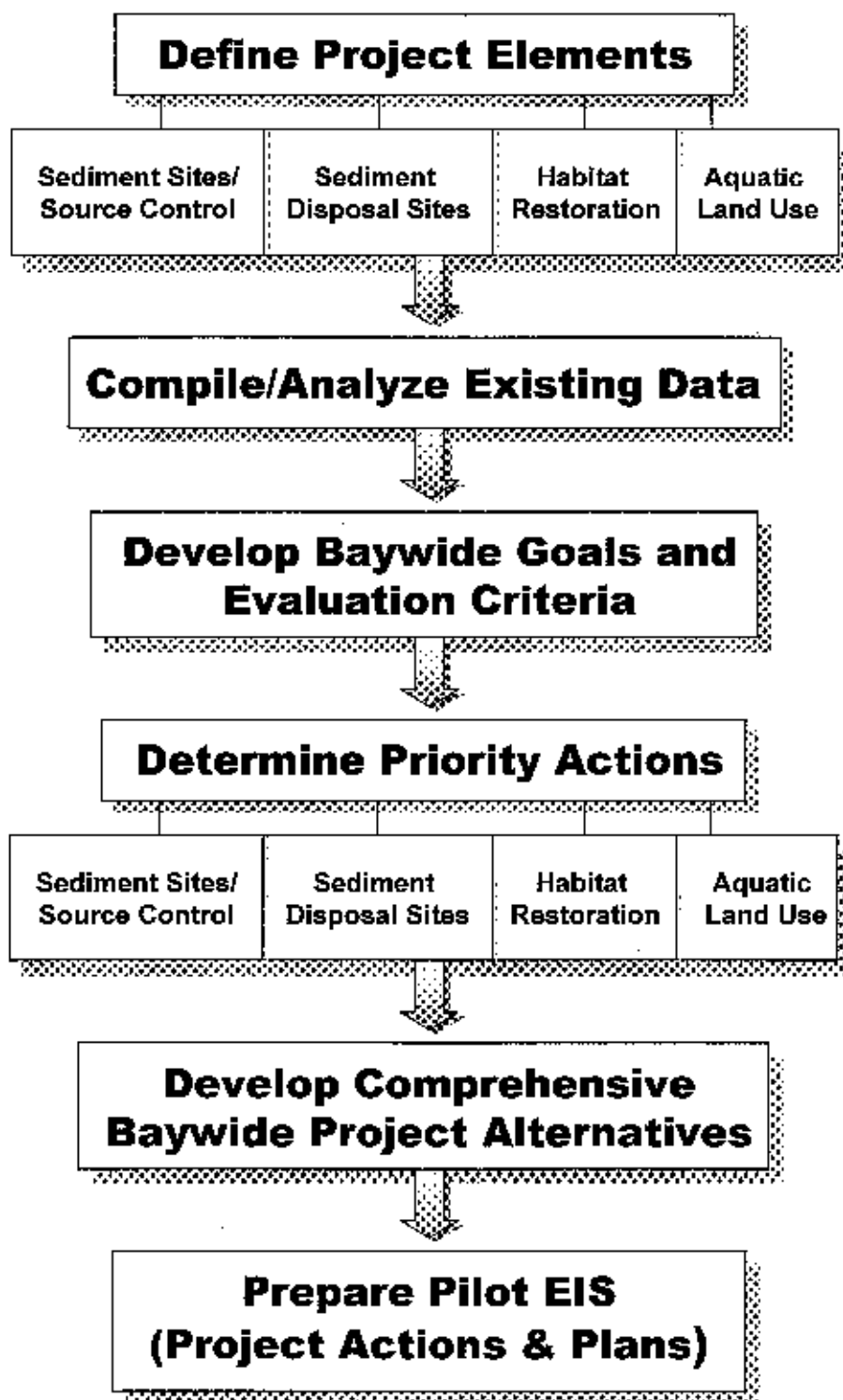


Figure 2. Overview of pilot process for determining priorities and developing project alternatives.

After the goals were developed, evaluation criteria were used to identify priorities within a given element. The evaluation criteria were developed in two sequential steps. First, a narrative description of each goal was prepared that defined the goal in the context of a specific element. Second, evaluation criteria with scoring guidelines were developed consistent with the narrative description of the goal. A numerical rating scheme (high = 5; low = 1) compared how well criteria were met. The scores from applying each criterion for any one goal were then summed and averaged to get an average score for each goal. Scores for all goals were then summed to get a total score. These total scores were compared and used to determine priorities.

Priorities

The preliminary results of prioritization within each element follow. The BBWG will finalize the results following review and comment on draft element-specific reports that are currently being written.

Disposal Sites

Identifying viable contaminated sediment disposal sites has been a challenge in virtually all of the urbanized bays in Puget Sound. In the Pilot, upland, nearshore, and confined aquatic disposal sites (CAD) were considered. The disposal site identification process included developing exclusionary and avoidance criteria as a screening step in the process, and then, similar to the other project elements, applying evaluation criteria and scoring guidelines to determine the final list of priorities. The exclusionary criteria were developed based on previous work from the Puget Sound Multi-user Disposal Siting report (PTI 1996) and Ecology's Recommended Standards for Confined Sediment Disposal (Ecology 1990). The exclusionary and avoidance criteria are provided in the Pilot's Draft Disposal Site Identification Report (Anchor Environmental LLC et al. 1998). Sixty-eight prospective sites were identified using these criteria. Of these 68, 36 were upland, 15 nearshore, and 17 were CAD sites. The 68 prospective sites were narrowed to a final list of eight sites by applying evaluation criteria and scoring guidelines derived from the seven goals of the BBWG. The evaluation criteria developed for disposal siting are provided as an example of what the evaluation criteria include, and are summarized in Table 1.

Table 1. Disposal sites—summary of evaluation criteria.

Goal	Criterion
1. Human Health and Safety	1A. Number of times the sediment has to be handled after dredging.
	1B. Short-term human exposure (risk of accident or release).
	1C. Long-term human exposure (risk of failure of engineered containment system).
	1D. Is disposal site an identified or suspected contaminated site from a human health perspective?
	1E. Would disposal control sources to sediments or water pose a human health concern?
2. Ecological Health	2A. Number of times the sediment has to be handled after dredging.
	2B. Short-term ecological exposure (risk of accident or release).
	2C. Long-term ecological exposure (risk of failure of engineered containment system).
	2D. Is disposal site an identified or suspected contaminated site from an ecological perspective?
	2E. Would disposal control sources to sediments or water pose an ecological health concern?
3. Protect/Restore Ecosystems	3A. Quality of existing habitat.
	3B. Restoration time frame.
	3C. Long-term quality and stability of final restored habitat.
	3D. Additional opportunity for protection or enhancement.
	3E. Adverse impacts to sediment deposition/transport.

Table 1. (continued)

Goal	Criterion
4. Social and Cultural Uses	4A. Current cultural/social use of disposal site area. 4B. Long-term social/cultural uses following disposal; site compatibility with land use plans. 4C. Additional opportunity for social/cultural uses.
5. Resource Management	5A. Potential reuse or conservation of renewable resources. 5B. Adequacy of existing infrastructure to utilize resources.
6. Faster, Better, Cheaper	6A. Integrated land use and environmental objectives. 6B. Adequacy of existing infrastructure. 6C. Relative site cost.
7. Economic Vitality	7A. Water-dependent commerce/navigation. 7B. Tribal economy. 7C. Facilitates property redevelopment and economic vitality?

Application of evaluation criteria for the first three primary goals to the 68 disposal sites resulted in 21 sites being identified for further evaluation. The remaining 21 sites were evaluated using the secondary goals and their criteria, and the results of that evaluation led to the following priority disposal sites.

Upland Sites:

Tulalip Landfill

Phyllite Quarry

Roosevelt Landfill

These eight priority sites:

Nearshore Sites:

Cornwall Avenue Landfill

Georgia-Pacific Log Pond

CAD Sites:

Cornwall Avenue Landfill

Georgia-Pacific ASB

Inner Bellingham Bay

- scored the highest among all disposal sites evaluated within a given disposal environment (i.e., upland, nearshore, or CAD);
- had confirmation with current owners that the site was available for disposal subject to future negotiated agreements pertaining to cost, schedule, and other considerations;
- had a minimum disposal capacity of 100,000 c.y.;
- for most of the CAD and nearshore sites accomplished multiple objectives by locating the disposal site over a contaminated sediment site; and
- will be carried forward into the element integration exercise.

Sediment Sites

Prospective sediment cleanup sites were identified from the existing SEDQUAL database maintained by Ecology, data from the ongoing Whatcom Waterway and Cornwall Avenue Landfill investigations, and other available data. Prospective cleanup sites were identified using Ecology's Contaminated Sediment Site Listing methodology, which defines a station cluster of potential concern. This exercise resulted in 10 areas of potential concern, including five known sites and five potential sites as defined by the state's guidelines for listing sites:

Known Sites:

Whatcom Waterway

Harris Avenue Shipyard

Georgia-Pacific Outfall

Cornwall Avenue Landfill

Olivine Nearshore Area

Potential Sites:

Boulevard Park

Inner Squalicum Harbor

Squalicum Shipyard

Taylor Avenue Docks

Weldcraft Steel & Marine

Using the evaluation criteria and scoring guidelines developed for this element, the prospective sites were ranked for priority to be integrated into the project alternatives. The five known sites were prioritized as follows:

High Priority Sites:

Whatcom Waterway

Medium Priority Sites:

Harris Avenue Shipyard

Cornwall Avenue Landfill

Low Priority Sites:

Olivine Nearshore Area

Georgia-Pacific Outfall

All of the high and medium priority known sites will be carried forward into the element integration exercise. The low priority known sites and potential sites will be addressed in the Remedial Action Plan, a supporting document to the project EIS that will be developed as part of the Pilot.

The Whatcom Waterway site will be further separated into several sub-areas. The sub-areas will be used to separate those sediment sites where removal is the only remediation option, as opposed to other sites where natural recovery, capping, or other non-removal oriented remediation techniques are viable. One of the primary reasons for the further separation is the fact that some of the contamination areas in the Whatcom Waterway site include federally authorized navigation channels.

Habitat

The process to determine priority habitat actions began with a workshop. Interested work group members were invited to attend with the objective of identifying key species whose habitat warranted protection and restoration in Bellingham Bay. Following the workshop members of the subcommittee met to develop a vision for the overall habitat restoration for Bellingham Bay. The overall vision developed for the bay with respect to habitat is to maximize productivity to the extent possible by:

- cleaning up contaminated sediments;
- controlling point and non-point sources of contamination;
- containing or removing shoreline landfills;
- restoring viable estuaries (Squalicum, Whatcom, Padden, and Little Squalicum);
- maximizing shoreline riparian vegetation;
- removing shoreline fills that result in a net gain in in-water habitat;
- removing remnant in-water structures;
- removing/replacing creosote treated piles; and
- identifying opportunities for restoration/protection not necessarily associated with compensatory mitigation.

The species of interest identified for the bay include:

- five Pacific salmon species,
- Dolly Varden,
- cutthroat trout and steelhead,
- sand lance and surf smelt,
- Pacific herring,
- ling cod,
- pandalid shrimp,
- Dungeness crab,
- and hardshell clams.

Having developed a vision and identified key species, the next step was to inventory the bay for prospective habitat restoration/enhancement opportunities. Using existing data and site knowledge, members of the BBWG identified approximately 40 potential sites to restore/enhance habitat. The Pilot goals and evaluation criteria were then used to winnow these prospective sites down to a shorter list of priority actions. In developing the evaluation criteria for determining priority habitat actions, the habitat subcommittee chose to rearrange the Pilot goals in terms of which ones were primary and which ones were secondary. Since the purpose of this element was restoration, the “protect and restore ecosystems” goal was chosen as the primary goal, and the remaining six goals were viewed as secondary. Using the evaluation criteria developed for habitat, 15 priority habitat actions were identified. The actions include removing fill and converting it to salt marsh and/or mudflat, restoring shallow water habitats through elevation and substrate modifications, and modifying subtidal elevations to shallower water eel grass habitats. Many of the priority restoration actions serve to provide connectivity from the mouth of the urban streams through the industrialized shoreline areas to the less developed and more natural shoreline areas of the bay.

Source Control

One of the objectives of the Pilot is to control sources of water quality and sediment quality problems in Bellingham Bay. As the existing data were reviewed, it became apparent that hazardous substance discharges are not affecting the water quality of Bellingham Bay, but are having an adverse impact on sediments. Therefore, the source control subcommittee decided to control ongoing upland sources of hazardous substances in the areas with impacted sediments. As a result, controlling known and potential sources with sediment cleanup will be linked as described in Table 2.

Table 2. Summary of the linkage between sediment sites and sources.

Known Sediment Sites	Known Sources	Potential Sources
1. Whatcom Waterway	1a) G-P groundwater mercury discharges to log pond 1b) City storm drain phenol and 4-methylphenol discharges	1c) Localized wood waste inputs (deleterious substances)
2. Harris Avenue Shipyard		2a) Shipyard operation (NPDES) 2b) Groundwater discharges
3. Cornwall Avenue Landfill	3a) Shoreline erosion of metals and solid waste 3b) Groundwater discharges of metals (water-only concern)	
4. Olivine Nearshore Area		4a) Upland runoff 4b) City storm drain discharges 4c) Groundwater discharges
5. G-P Outfall		5a) Wastewater (NPDES)
Potential Sediment Sites	Known Sources	Potential Sources
6. Boulevard Park		6a) Upland runoff 6b) Groundwater discharges
7. Inner Squalicum Harbor		7a) Upland runoff 7b) Groundwater discharges
8. Squalicum Shipyard		8a) Shipyard operation 8b) Groundwater discharges
9. Taylor Avenue Docks		9a) Upland runoff 9b) Groundwater discharges
10. Weldcraft Steel & Marine		10a) Upland runoff 10b) Groundwater discharges

Given the close linkage between sediment sites and sources, the subcommittee decided it was not necessary to develop evaluation criteria to determine priority actions. The priority sources that will be addressed through the Pilot are reflected in the sediment cleanup priorities.

Aquatic land use

Integrating aquatic land use issues into sediment cleanup and habitat restoration is an important part of the Pilot. The mechanism for accomplishing this integration will be two-fold. First, priority land use actions will be integrated into the project alternatives along with priorities from the other project elements. Second, an Aquatic Land Use plan will be developed as part of the Pilot.

Evaluation criteria will not be developed to identify priority aquatic land use actions. Rather, the key decision-makers in shoreline uses and designations (i.e., the City, Port, and DNR), will identify priorities through their Shoreline Master Plan and Harbor Area Master Plan documents. Draft project alternatives will then be crafted to incorporate as many priority aquatic land use actions as possible while balancing sediment cleanup and habitat restoration. The draft project alternatives will also be evaluated to determine what future land use opportunities they provide. The outcome of that evaluation will be the basis for preparing the Aquatic Land Use Plan. This plan will serve to guide future aquatic land use decisions in Bellingham Bay and will be an appendix to the Pilot EIS (described previously). It is expected that updates to formal planning documents (e.g., SMP and Master Plans) will occur concurrently through separate but related actions by the Port or City.

Next Steps

The Pilot is currently completing the element integration exercise and developing project alternatives. A Purpose and Need Statement for use in the EIS is being finalized and all project alternatives carried forward to the EIS will be judged according to their ability to meet the purpose and need. The current schedule calls for EIS scoping in May 1998. The EIS and planning documents will be prepared at the same time immediately following scoping. As the alternatives are being evaluated, the Work Group will begin the process of selecting a preferred alternative, using the outcome of the SEPA EIS as one of the major factors in selecting a preferred alternative. A draft EIS is currently planned for fall of 1998; and a final EIS and project implementation activities in the spring of 1999.

Acknowledgements

The authors would like to thank the members of the Bellingham Bay Work Group for their continued hard work and cooperative spirit on the Pilot. In addition to the regular work group meetings, many members have provided additional time on various subcommittees. We would also like to thank the many other agency staff who, while not regular BBWG members, contributed their time and energy on specific tasks on the Pilot. In particular we would like to thank Dr. Teresa Michelsen for her creativity and contribution in providing the process framework for priority setting. Also, Tracey McKenzie and Clay Patmont, while not authors on this paper, certainly deserve much of the credit for the progress and results made to date on the Pilot.

References

- Anchor Environmental, LLC, et al. 1998. Draft Disposal Site Identification Report, Bellingham Bay Demonstration Pilot Project, January, 1998.
- Department of Ecology. 1990. Standards for Confined Disposal of Contaminated Sediments, Development Documentation, January, 1990.
- PTI. 1996. Recommended Siting Process, Multiuser Confined Disposal Site Program, Multiuser Confined Disposal Site Interagency Management Committee. Olympia, WA.